Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (previously presented): A carbon nanotube-based field emission device comprising:

a cathode electrode; and

a carbon nanotube array of nanotube members, the carbon nanotube array of the nanotube members extending from a root end to a growth end, the carbon nanotube array being aligned perpendicular to the cathode electrode with each given growth end embedded in the cathode electrode and the corresponding root end being outwardly directed and exposed;

wherein the growth end of the carbon nanotube array is in electrical contact with the cathode electrode, and the root end thereof defines a planar surface with a flatness of less than one micron across the carbon nanotube array.

Claim 2 (cancel):

Claim 3 (original): The field emission device as described in claim 1, wherein the cathode electrode is made of copper.

Claim 4 (original): The field emission device as described in claim 1, wherein the carbon nanotube array comprises a plurality of carbon nanotubes,

each of which has an open tip.

Claim 5 (original): The field emission device as described in claim 1, wherein a height of the carbon nanotube array is in the range from 5 microns to 10 mm.

Claim 6 (original): The field emission device as described in claim 1, wherein the height of carbon nanotube array is in the range from 10 to 500 microns.

Claim 7 (previously presented): The field emission device as described in claim 1, wherein an insulative barrier having a height exceeding the planar surface of the root end is formed adjacent the carbon nanotube array and at least a gate electrode is formed on the barrier such that the gate electrode is separated from the cathode electrode.

Claim 8 (previously presented): The field emission device as described in claim 7, wherein the root end of the carbon nanotube array reaches the interface between the barrier and the gate electrode.

Claim 9 (previously presented): A carbon nanotube-based field emission device comprising:

a carbon nanotube array which grows from a root end and extends to a growth end; and

a cathode electrode formed on and covering the growth end of the carbon nanotube array;

wherein the root end defines a planar surface which is exposed outwardly and acts as an emitter, a flatness of the planar surface of the root end of the carbon nanotube array is less than 1 micron, and the growth end is embedded into the cathode electrode.

Claim 10 (cancel):

Claim 11 (original): The field emission device as described in claim 9, wherein the carbon nanotube array comprises a plurality of carbon nanotubes, each of which has an open tip.

Claim 12 (original): The field emission device as described in claim 9, wherein a height of the carbon nanotube array is in the range from 5 microns to 10 mm.

Claim 13 (original): The field emission device as described in claim 9, wherein the height of carbon nanotube array is in the range from 10 to 500 microns.

Claim 14 (original): The field emission device as described in claim 9, wherein at least a gate electrode is formed adjacent the carbon nanotube array at a height above the planar surface of the root end.

Claim 15 (original): The field emission device as described in claim 14, wherein the gate electrode is supported by an insulative barrier formed adjacent the carbon nanotube array, such that the gate electrode is separated from the cathode electrode.

Claim 16 (currently amended): A method of making a carbon nanotube-based field emission device, comprising steps of:

providing a working plate having a planar surface;

depositing a catalyst layer on the planar surface of the working plate;

growing a carbon nanotube array on said catalyst layer wherein carbon nanotubes in said array extend from said catalyst layer with flat roots and define different heights with tips;

applying a cathode electrode to said tips of said carbon nanotubes;

separating said carbon nanotubes from said catalyst layer and exposing said flat roots so that the flat roots of the carbon nanotube array are thereby configured for acting as electron emission ends of the carbon nanotube-based field emission device; and

providing a gate electrode beside said flat roots.

Claim 17 (original): The method as described in claim 16, wherein said gate electrode is supported by a barrier which is seated upon the cathode electrode.

Claim 18 (previously presented): The method as described in claim 17, wherein a height of said barrier is equal to a common height of said carbon nanotubes measured from the cathode electrode.

Claim 19 (original): The method as described in claim 17, wherein said cathode electrode is originally supportably seated upon said barrier for applying said cathode electrode to the tips after growth of said carbon nanotubes.

Claim 20 (currently amended): The method as described in claim 16, wherein ~~said catalyst layer is provided on a planar surface of a working plate,~~ said planar surface of the working plate having a flatness of less than one micron.